YRC1000 OPTIONS INSTRUCTIONS
FOR I/O JOG OPERATION IN PLAY MODE

Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN INSTRUCTIONS

Please have the following information available when contacting Yaskawa Customer Support:

- System
- Primary Application
- Software Version (Located on Programming Pendant by selecting: [Main Menu] - [System Info] - [Version])
- Robot Serial Number (Located on robot data plate)
- Robot Sales Order Number (Located on controller data plate)

Part Number: 178944-1CD
Revision: 0
DANGER

• This manual explains the I/O JOG operation in the play mode of the YRC1000 system. Read this manual carefully and be sure to understand its contents before handling the YRC1000. Any matter, including operation, usage, measures, and an item to use, not described in this manual must be regarded as "prohibited" or "improper".

• General information related to safety are described in "Chapter 1. Safety" of the YRC1000 INSTRUCTIONS. To ensure correct and safe operation, carefully read "Chapter 1. Safety" of the YRC1000 INSTRUCTIONS.

CAUTION

• In some drawings in this manual, protective covers or shields are removed to show details. Make sure that all the covers or shields are installed in place before operating this product.

• YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids the product warranty.

NOTICE

• The drawings and photos in this manual are representative examples and differences may exist between them and the delivered product.

• YASKAWA may modify this model without notice when necessary due to product improvements, modifications, or changes in specifications. If such modification is made, the manual number will also be revised.

• If your copy of the manual is damaged or lost, contact a YASKAWA representative to order a new copy. The representatives are listed on the back cover. Be sure to tell the representative the manual number listed on the front cover.
NOTES FOR SAFE OPERATION

Read this manual carefully before installation, operation, maintenance, or inspection of the YRC1000.

In this manual, the Notes for Safe Operation are classified as “DANGER”, “WARNING”, “CAUTION”, or “NOTICE”.

**DANGER**
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Safety Signs identified by the signal word DANGER should be used sparingly and only for those situations presenting the most serious hazards.

**WARNING**
Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury. Hazards identified by the signal word WARNING present a lesser degree of risk of injury or death than those identified by the signal word DANGER.

**CAUTION**
Indicates a hazardous situation, which if not avoided, could result in minor or moderate injury. It may also be used without the safety alert symbol as an alternative to “NOTICE”.

**NOTICE**
NOTICE is the preferred signal word to address practices not related to personal injury. The safety alert symbol should not be used with this signal word. As an alternative to “NOTICE”, the word “CAUTION” without the safety alert symbol may be used to indicate a message not related to personal injury.

Even items described as “CAUTION” may result in a serious accident in some situations. At any rate, be sure to follow these important items.

To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as “DANGER”, “WARNING” and “CAUTION.”
Before operating the manipulator, make sure the servo power is turned OFF by performing the following operations. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.

- Press the emergency stop buttons on the front door of the YRC1000, on the programming pendant, on the external control device, etc.
- Disconnect the safety plug of the safety fence. (when in the play mode or in the remote mode)

If operation of the manipulator cannot be stopped in an emergency, personal injury and/or equipment damage may result.

Failure to observe this instruction may cause unintended movement of the manipulator, which may result in personal injury.

Observe the following precautions when performing a teaching operation within the manipulator’s operating range:

- Be sure to perform lockout by putting a lockout device on the safety fence when going into the area enclosed by the safety fence. In addition, the operator of the teaching operation must display the sign that the operation is being performed so that no other person closes the safety fence.
- View the manipulator from the front whenever possible.
- Always follow the predetermined operating procedure.
- Always keep in mind emergency response measures against the manipulator’s unexpected movement toward a person.
- Ensure a safe place to retreat in case of emergency.

Failure to observe this instruction may cause improper or unintended movement of the manipulator, which may result in personal injury.

- Confirm that no person is present in the manipulator’s operating range and that the operator is in a safe location before:
  - Turning ON the YRC1000 power
  - Moving the manipulator by using the programming pendant
  - Running the system in the check mode
  - Performing automatic operations

Personal injury may result if a person enters the manipulator’s operating range during operation. Immediately press an emergency stop button whenever there is a problem. The emergency stop buttons are located on the front panel of the YRC1000 and on the right of the programming pendant.

- Read and understand the Explanation of the Warning Labels before operating the manipulator.
Definition of Terms Used Often in This Manual

The MOTOMAN is the YASKAWA industrial robot product.

The MOTOMAN usually consists of the manipulator, the controller, the programming pendant, and supply cables.

In this manual, the equipment is designated as follows.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>YRC1000 controller</td>
<td>YRC1000</td>
</tr>
<tr>
<td>YRC1000 programming pendant</td>
<td>Programming pendant</td>
</tr>
<tr>
<td>Cable between the manipulator and the controller</td>
<td>Manipulator cable</td>
</tr>
</tbody>
</table>

WARNING

• Perform the following inspection procedures prior to conducting manipulator teaching. If there is any problem, immediately take necessary steps to solve it, such as maintenance and repair.
  – Check for a problem in manipulator movement.
  – Check for damage to insulation and sheathing of external wires.

• Always return the programming pendant to the hook on the YRC1000 cabinet after use.

If the programming pendant is left unattended on the manipulator, on a fixture, or on the floor, etc., the Enable Switch may be activated due to surface irregularities of where it is left, and the servo power may be turned ON. In addition, in case the operation of the manipulator starts, the manipulator or the tool may hit the programming pendant left unattended, which may result in personal injury and/or equipment damage.
Descriptions of the programming pendant keys, buttons, and displays are shown as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming Pendant</td>
<td></td>
</tr>
<tr>
<td>Character Keys /Symbol Keys</td>
<td>The keys which have characters or its symbol printed on them are denoted with [ ].</td>
</tr>
<tr>
<td></td>
<td>ex. [ENTER]</td>
</tr>
<tr>
<td>Axis Keys /Numeric Keys</td>
<td>[Axis Key] and [Numeric Key] are generic names for the keys for axis operation and</td>
</tr>
<tr>
<td></td>
<td>number input.</td>
</tr>
<tr>
<td>Keys pressed simultaneously</td>
<td>When two keys are to be pressed simultaneously, the keys are shown with a</td>
</tr>
<tr>
<td></td>
<td>&quot;+&quot; sign between them, ex. [SHIFT]+[COORD]</td>
</tr>
<tr>
<td>Displays</td>
<td>The menu displayed in the programming pendant is denoted with { }.</td>
</tr>
<tr>
<td></td>
<td>ex. {JOB}</td>
</tr>
</tbody>
</table>

**Description of the Operation Procedure**

In the explanation of the operation procedure, the expression "Select • • • " means that the cursor is moved to the object item and [SELECT] is pressed, or that the item is directly selected by touching the screen.

**Registered Trademark**

In this manual, names of companies, corporations, or products are trademarks, registered trademarks, or brand names for each company or corporation. The indications of (R) and TM are omitted.
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The I/O JOG function performs the axis operation of the control group (henceforth written as "I/O JOG operation") by using general-purpose input signals instead of the programming pendant axis keys. The I/O JOG function of the YRC1000 has the following differences in comparison to the function of the previous controller such as the DX200.

### Table 1-1: Difference of the Function

<table>
<thead>
<tr>
<th></th>
<th>DX200 or earlier controllers</th>
<th>YRC1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group of the operation target</td>
<td>Station</td>
<td>All control groups (robot, base, station)</td>
</tr>
<tr>
<td>Operation enabled mode</td>
<td>Play mode</td>
<td>Play mode, teach mode</td>
</tr>
</tbody>
</table>
| Operation coordinates system | Link                        | Link
|                           |                              | Cartesian (only during robot operation)  |

#### Operation coordinates system

**Link coordinates:** Each axis of the manipulator or of the external axis moves independently.

**Cartesian coordinates:** The manipulator tip (the tool center point) moves in parallel with the X-axis, Y-axis and Z-axis set to the manipulator. Also, just the posture can be changed without changing the tool center point.

*Fig. 1-1: Operation Coordinates System*
1.1 Motion Conditions

- **Control group of the operation target**
  - A control group which can perform the I/O JOG operation is not included in the job during the playback operation.
  - Playback operation of the job which includes the control group during the I/O JOG operation cannot be performed.
  - When plural control groups exist, the I/O JOG operation cannot be executed simultaneously.

- **When Executing I/O JOG Operation**
  - If performing I/O JOG operation in the teach mode, it is necessary to grip the enable switch to turn ON the servo power supply.
  - The operation coordinates system cannot be changed during the I/O JOG operation.
  - By using the coordinate system, other than the link coordinate system and the cartesian coordinate system, the operation cannot be performed.

- **Others**
  - When displaying split windows by using the multi-window function, the active window cannot be changed during the I/O JOG operation.
  - Connect the control group to the power on unit #1 to 3/STO, and for control groups which are not operating, it is recommended to turn OFF the servo power supply.

*Fig. 1-2: Outline of I/O JOG Operation*
2 Signal for I/O JOG Operation

Categorized as the input signal to perform the I/O JOG operation and the signal to output the operation status. For these signals, each general-purpose input signal and general-purpose output signal is used.

2.1 Input Signal

Table 2-1: List of Input Allocation Items

<table>
<thead>
<tr>
<th>Item Name</th>
<th>Detection Method</th>
<th>Meaning</th>
<th>Remark</th>
</tr>
</thead>
</table>
| Axis operation request | Rising edge      | Switches to a I/O JOG enabled state (described later).                 | • The GP input signal which is already allocated to other control group cannot be allocated.  
• If an axis operation request signal from plural control groups is received, the state cannot be switched to a state where I/O jog operation is enable. |
|                      |                  | OFF: State cancellation                                               |                                                                        |
|                      |                  | ON: State setting                                                      |                                                                        |
| Coordinate Selection | State            | Selects the coordinate system to perform the robot I/O JOG operation.  | • Displayed only on the robot setting window.  
• According to the signal state at switching to the I/O JOG operation enabled state, the coordinate is selected. |
|                      |                  | OFF: Link coordinate                                                  |                                                                        |
|                      |                  | ON: Cartesian coordinate                                              |                                                                        |
| Axis designation     | State            | Selects the axis to move when in the I/O JOG operation enabled state.  | • By receiving plural axis designation signals simultaneously, operations can be performed simultaneously. However, if a forward-direction signal and a reverse-direction signal of the same axis are received simultaneously, the axis will not move. |
|                      |                  | For each axis, the forward-direction (+) and reverse-direction (-) exist. |                                                                        |
|                      |                  | OFF: Operation stop                                                    |                                                                        |
|                      |                  | ON: Operation request                                                  |                                                                        |
| Signal details       |                  |                                                                        |                                                                        |
| Robot                |                  |                                                                        |                                                                        |
| S / X (+, -)         |                  | 1 (+, -)                                                              |                                                                        |
| L / Y (+, -)         |                  | 2 (+, -)                                                              |                                                                        |
| U / Z (+, -)         |                  | 3 (+, -)                                                              |                                                                        |
| R / Rx (+, -)        |                  | 4 (+, -)                                                              |                                                                        |
| B / Ry (+, -)        |                  | 5 (+, -)                                                              |                                                                        |
| T / Rz (+, -)        |                  | 6 (+, -)                                                              | (Only the existing axes are displayed.)                               |
| E / Re (+, -)        | (E is displayed only when the 7-axis robot)                         |                                                                        |
| Speed level          | State            | Designates the motion speed. Each speed shall be the same as the manual speed. | • If plural speed designation signals are received simultaneously, the slowest speed of them is selected.  
• During the teach mode, even if this signal is not received, the I/O JOG operation is enabled. The speed in this case shall be the manual speed. It can be changed from the programming pendant. |
|                      |                  | OFF: Without designation                                              |                                                                        |
|                      |                  | ON: With designation                                                  |                                                                        |
| 1 (Inching)          |                  |                                                                        |                                                                        |
| 2 (Low speed)        |                  |                                                                        |                                                                        |
| 3 (Medium speed)     |                  |                                                                        |                                                                        |
| 4 (High speed)       |                  |                                                                        |                                                                        |
| 5 (Ultra-high speed) |                  |                                                                        |                                                                        |
2 Signal for I/O JOG Operation
2.1 Input Signal

I/O JOG Operation Enabled State

Indicates that the I/O JOG operation is ready to be operated. If the axis designation signal is turned ON in this state, the control group moves. I/O jog operation is enabled when the following conditions are all met;

- The servo power supply is ON.
- (If plural control groups exist) The axis motion request signal is ON for only one control group.
- (If in the play mode) Either of the speed level designation signals is ON.

Coordinate Selection Signal

If the robot is performed by using the I/O JOG operation, according to the cartesian selection signal, the motion coordinate can be selected from the link coordinates or the cartesian coordinates. The motion coordinate for the base and the station takes the link coordinate only.

The motion coordinate is determined according to the coordinate selection signal state when switched to the I/O JOG operation enabled state. Once the motion coordinate is determined, it cannot be changed until switched to the next I/O JOG operation enabled state.

※ Safety Interlocks

- When switching the I/O JOG operation enabled state while either axis designation signal is turned ON in regardless of the forward or reverse rotation, if all axis designation signals are set to OFF temporarily, the I/O JOG operation can be performed.
- If the axis operation request signals from plural control groups are set to ON simultaneously, the state will not switch to the I/O JOG operation enabled state.
- If performing an I/O JOG operation again after the I/O JOG operation is interrupted due to an alarm/hold/emergency stop/servo OFF/switching the mode, set all the axis designation signals to OFF temporarily, and then set them to ON again.
2.2 Output Signal

Table 2-2: List of Output Allocation Items

<table>
<thead>
<tr>
<th>Item name</th>
<th>Meaning</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis operation enabled</td>
<td>Indicates the I/O JOG operation state.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFF: I/O JOG operation disabled</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ON: I/O JOG operation enabled</td>
<td></td>
</tr>
<tr>
<td>Axis operating</td>
<td>Indicates the I/O JOG operation execution state.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFF: An I/O JOG operation is not executing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ON: An I/O JOG operation is executing.</td>
<td></td>
</tr>
</tbody>
</table>
2.3 Signal Allocation Setting Window for I/O JOG Operation

Select {IN/OUT} - {AXIS I/O ALLOC} under the Main Menu, the AXIS I/O ALLOC window appears. By using this window, set the I/O signal used in the I/O JOG operation. When the security mode is set in the management mode or in the higher mode, the setting can be performed.

### AXIS I/O ALLOC

#### INPUT

1. MODE REQUEST (I/O JOG operation request)
2. COORDINATE (motion coordinates selection (link/cartesian))
3. AXIS
4. SPEED (motion speed designation)
5. MODE (I/O JOG operation enabled)
6. OPERATING (during I/O JOG operation)

1 to 4 are for setting general-purpose input signal (IN#0001 to IN#4096), and 5 to 6 are for general-purpose output signal (OT#0001 to OT#4096).

For canceling signal settings, enter "0".

#### OUTPUT

When setting general-purpose I/O signals, confirm that the signal is not being used by a different function. If the signal allocation is duplicated, an unintended I/O JOG operation may be performed, or the output operation may not be performed correctly.
If plural control groups exist, the control group to set can be switched by using [PAGE]. In this case, the identical number as the other control group cannot be allocated to the ① MODE REQUEST.

Also, depending on the robot axis or the external axis (the base or the station), some of the setting items shown below are different. (For the number, refer to the previous page.)

The existence of the ② COORDINATE signal display is different.

③ Like images, the window is switched in each control group type.

### [Robot Axis Setting Window]

<table>
<thead>
<tr>
<th>AXIS</th>
<th>(+)</th>
<th>(-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1 :</td>
<td>S /</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>L /</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>U /</td>
<td>Z</td>
</tr>
<tr>
<td></td>
<td>R /</td>
<td>Rx</td>
</tr>
<tr>
<td></td>
<td>B /</td>
<td>Ry</td>
</tr>
<tr>
<td></td>
<td>T /</td>
<td>Rz</td>
</tr>
</tbody>
</table>

### [Base Axis Setting Window]

<table>
<thead>
<tr>
<th>AXIS</th>
<th>(+)</th>
<th>(-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1 :</td>
<td>1</td>
<td>IN#</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>IN#</td>
</tr>
</tbody>
</table>

### [Station Axis Setting Window]

<table>
<thead>
<tr>
<th>AXIS</th>
<th>(+)</th>
<th>(-)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1 :</td>
<td>1</td>
<td>IN#</td>
</tr>
</tbody>
</table>
### 2.4 Example of I/O JOG Operation Execution

When performing the I/O JOG operation of the robot axis in the play mode, the change in signal status is described below.

*Fig. 2-1: Figure of Status Transitions During I/O JOG Operation Execution*

<table>
<thead>
<tr>
<th>Event</th>
<th>Status Transitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis motion request (IN)</td>
<td>OFF to ON</td>
</tr>
<tr>
<td>Coordinate selection (IN)</td>
<td></td>
</tr>
<tr>
<td>Speed level (IN)</td>
<td></td>
</tr>
<tr>
<td>Servo power supply status</td>
<td></td>
</tr>
<tr>
<td>Axis motion enabled (OUT)</td>
<td></td>
</tr>
<tr>
<td>Link coordinate motion section</td>
<td></td>
</tr>
<tr>
<td>Cartesian coordinate motion section</td>
<td></td>
</tr>
<tr>
<td>Axis designation (IN)</td>
<td></td>
</tr>
<tr>
<td>S / X(+)</td>
<td></td>
</tr>
<tr>
<td>Axis operating (OUT)</td>
<td></td>
</tr>
</tbody>
</table>

1. **Axis motion request signal OFF to ON**
   
   Because the speed level designation is set to ON and the servo power supply status is set to ON, the state switches to the I/O JOG operation enabled state. Because the coordination selection signal is set to OFF, following I/O JOG operations are performed in the link coordinates system.

2. **Axis designation signal (S/X(+)) OFF to ON**
   
   The I/O JOG operation starts. The S-axis of the robot moves in the forward direction.

3. **Coordinate selection signal OFF to ON**
   
   The operation coordinate system is not changed, and it remains with the link coordinate selection state.
   
   The S-axis forward direction motion of the robot continues.

4. **Axis designation signal (S/X(+)) ON to OFF**
   
   The I/O JOG operation completes and the robot stops.

5. **Axis motion request signal ON to OFF**
   
   The I/O JOG operation enabled state is canceled.

6. **Axis designation signal (S/X(+)) OFF to ON**
   
   Since it is not in the I/O JOG operation enabled state, the I/O JOG operation is not executed.

7. **Axis motion request signal OFF to ON**
   
   The state switches to a I/O JOG enabled state. Because the coordination selection signal is ON, following I/O JOG operations are operated in the cartesian coordinates system.
2 Signal for I/O JOG Operation

2.4 Example of I/O JOG Operation Execution

8. Axis designation signal (S/X(+)) OFF to ON

The I/O JOG operation starts. The tool center point of the robot moves parallel in a forward direction of the X-axis.

9. Coordinate selection signal OFF to ON

The operation coordinate system is not changed, and it remains with the cartesian coordinate selection state. The parallel operation in a forward direction of the X-axis of the robot tool center point continues.
3 External Memory

The settings which are performed in the axis motion I/O allocation window can be backed up to an external memory.

In the "SYSTEM DATA" of the EXTERNAL MEMORY DEVICE, the line, "AXIS I/O ALLOC DATA IOAXIS.DAT" is added, and when this line is selected, the operations, LOAD, SAVE, VERIFY, and DELETE are available.

**NOTE**

If having loaded the saved file to another controller, confirm that there are no problems with the settings.
4 Servo Power Supply Individual Control Function

4.1 Outline

The servo power supply individual control function is to turn ON/OFF the servo power supply in units of specified control group freely in the robot system with multiple control group configuration.

Using this function, without stopping whole system operation, the servo power supply only for the control group selected by an operator can be turned OFF. Therefore, the safe operation for removing a workpiece with the system running and maintenance for the robot tool, is secured, moreover, the operating efficiency is increased.

NOTE

The servo power supply individual control function is to control the servo power supply in units of contactor unit or STO. To use this function, use the contactor or STO originally designed for separation in units of control group.
4.2 Setting the Signals for Servo Power Supply Individual Control

To use the servo power individual control function, the control group and the ON_ENABLE signal (“ON_EN” signal) need to be allocated as follows.

1. Turn ON the power of YRC1000 by selecting the (Main Menu) of the programming pendant.

   – Then “Maintenance mode” starts.

2. Select {SYSTEM} in the main menu, and then select {SECURITY}.

   – A security mode selection window appears. Press {SELECT} of the programming pendant to select the maintenance mode.
4 Servo Power Supply Individual Control Function

4.2 Setting the Signals for Servo Power Supply Individual Control

- Input the password of the maintenance mode, and press "[ENTER]".

- If the password is correct, the security mode changes to the management mode.

3. Select {SETTING} in the main menu, and then select {SYSTEM} and {OPTION FUNCTION}.

- The option function list appears.
- Select "SERVO POWER INDIVIDUAL CONTROL".
4 Servo Power Supply Individual Control Function
4.2 Setting the Signals for Servo Power Supply Individual Control

- The following window appears. (The control group configuration below is an example.)

![Diagram]

① Servo Control Circuit Board
“SV” is a servo control circuit board.
“#1” is the first servo control circuit board. Up to eight servo control circuit boards can be connected.

② Each servo control circuit board can set one of the signals from ON_EN1 to ON_EN4.

- Move the cursor to the control group to set, then press [SELECT] of the programming pendant.
4. Servo Power Supply Individual Control Function
4.2 Setting the Signals for Servo Power Supply Individual Control

- After setting the control group and the “ON_EN” signal, press [ENTER] of the programming pendant. The following window appears.

- Select {YES} to update the system parameter. When the following window appears, the data update is completed.

**NOTE**
- Set the same “ON_EN” signal to the robot control group and to the base control group if they are on the same servo control circuit board (SV#1 to SV#8 maximum).
- Changing “ON_EN” signal of the robot control group is invalid when the security mode is the management mode.
- The “SERVO POWER INDIVIDUAL CONTROL” appears by selecting {SYSTEM} - {SETUP} - {OPTION FUNCTION} is displayed only for the robot controller which is configured with STO.
4 Servo Power Supply Individual Control Function
4.3 Connection of Signals for Servo Power Supply Individual Control

**4.3 Connection of Signals for Servo Power Supply Individual Control**

The servo power supply individual control function turns ON/OFF the servo power supply in units of STO or the contactor unit, and is controlled by “ON_EN” signal of the safety terminal block circuit board is used.

“ON_EN” signals is connected to the following terminals of the safety terminal block circuit board (IM-YE250/2-80P).

- The ON_EN1 signal of -21, -22 and -23, -24 controls the ON/OFF of the servo power supply of the control group allocated ON_EN1 or TU#1.
- The ON_EN2 signal of -25, -26 and -27, -28 controls the ON/OFF of the servo power supply of the control group allocated ON_EN2 or TU#2.
- The ON_EN3 signal of -29, -30 and -31, -32 controls the ON/OFF of the servo power supply of the control group allocated ON_EN3 or TU#3.
- The ON_EN4 signal of -33, -34 and -35, -36 controls the ON/OFF of the servo power supply of the control group allocated ON_EN4 or TU#4.

**NOTE**

For safety reasons, dual circuits are used for the Servo-ON Enable input signals. Connect the signal so that both input signals are turned ON or OFF at the same time.

If a single signal is turned ON, an alarm occurs.

Connect the servo power individual control signal by the following procedure.

1. Remove the cable (jumper cable) which is connected to the terminals above.

2. As shown in the following figure, connect the output contact such as area sensor to the “ON_EN” terminal.
For the wiring termination and connecting method, refer to “Wiring Procedure of the Terminal Block” of “Chap. 14.6 Safety Terminal Block Circuit Board” in “YRC1000 INSTRUCTIONS (RE-CTO-A221)”. When shipping, between the above mentioned terminals are short-circuited.
4.4 Confirming Connection

The status of “ON_EN” signals connected to each contactor unit and the servo power supply status can be confirmed on the SERVO POWER STATUS window.

1. Select {IN/OUT} under the main menu.
2. Select {SV POWER STATUS}.

- The SERVO POWER STATUS window appears.

① ON_EN SIGNAL
Displays the status of “ON_EN” signal of the contactor unit connected to each control group.
- O: Open (OFF) status
  - Turns OFF the servo power supply.
- ●: Closed (ON) status
  - Turns ON the servo power supply when the servo ON lamp is lit.

② SERVO ON
Displays the status of the servo power supplied to each control group.
- O: Servo power OFF status
- ●: Servo power supply ON completed status
4.5 Application Examples

4.5.1 Turning ON Only the Servo Power Supply for the Selected Control Group at Teaching

At turning the servo ON, only the servo power supply for the selected control group can be turned ON.

As shown below, when the servo power supply is turned ON with only the “ON_EN” signal of the contactor unit connected to S2 set to “ON”, the servo power is supplied only to S2.
4.5.2 Turning OFF the Servo Power Supply which is Selected Control Group at Playback

When an operator touches the positioner in such a case as replacement of workpiece, only the servo power supply for the positioner to which the operator touches can be turned OFF for security.

Even during the play back operation, by setting “OFF” to “ON_EN” signal of the contactor unit to which S2 is connected, only the servo power supply to S2 can be turned OFF.

While the servo ON lamp is lit, if “ON_EN” signal is turned ON, the servo power supply for the corresponding control group is turned ON.

To control each servo power supply for a selected control group without stopping the whole system during playback, it is necessary to prepare an application job, using the independent control function.
4.6 System Output Signals

4.6.1 Servo Power ON Status Signal for Each Control Group

The servo power ON status of each control group is output to the following system output signal.

In the standard concurrent I/O ladder, these system output signals are not output externally. When installing an interlock operated by PLC, etc., modify the concurrent I/O ladder so that the system output signals are output externally.

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<tr>
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4.6.2 “During Servo ON” Signal

The system output signal 50073 (during servo ON) is output in connection with the servo ON lamp on the programming pendant.

After the servo power supply is turned ON, even if all the “ON_EN” signals connected to contactor unit are set to “OFF”, the servo ON lamp remains lit and the system output signal “During Servo ON” does not turn “OFF”.
4.7 Operation of Job without Control Group Specification

When the servo power supply is individually turned OFF where jobs in multiple number of tasks are operated using the independent control function, the job execution of the control group whose servo power supply is turned OFF is interrupted.

The jobs of other control groups continue their execution.

For the jobs without control group specification such as master job, the conditions for execution can be set by the parameter.

<table>
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<tr>
<th>Parameter</th>
<th>Contents and Set Value</th>
<th>Initial Value</th>
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<tr>
<td>S2C687 (Condition of execution of job without control group specification)</td>
<td>0: Execution possible only when servo power supply to all the axes have been turned ON 1: Execution possible when servo power supply to any axis is turned ON.</td>
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